AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to Figure 4. This sheet, which includes Figures 3 and 4, replaces the original sheet including Figures 3 and 4. In Figure 4, the label "Prior Art" has been added to the drawings, as requested in the Office Action. Approval of the drawings is respectfully requested.

REMARKS

The Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and the following remarks.

By the foregoing amendment, claims 1, 2, and 5 have been amended. Claims 1-7 are currently pending in the application and subject to examination. No new matter has been added.

Objections to the Claims

Claim 5 is objected to for having a lack of antecedent basis. By this amendment, Claim 5 has been amended responsive to this rejection. If any additional amendment is necessary to overcome this rejection, the Examiner is requested to contact the Applicant's undersigned representative at the number listed below.

Rejection under 35 U.S.C. § 102(b)

Claims 1 and 2 are rejected under 35 U.S.C. § 102(b) as being anticipated by Murata et al. (U.S. Patent No. 5,953,198, hereinafter "Murata"). To the extent the rejection remains applicable to the claims currently pending, the Applicant respectfully traverses the rejection.

Claim 1, as amended, discloses an excitation control circuit composed of a driving circuit for driving a coil of a solenoid in response to a pulse signal supplied from an external drive, a counter-electromotive force absorbing circuit, inserted in a path of a return current of the coil, for absorbing counter-electromotive force produced by the coil, a return current circuit, connected in parallel to the counter-electromotive force absorbing circuit, and a control circuit for outputting a pulse signal for intermittently

bypassing the return current through the return current circuit while the return current attenuates.

The Applicant has reviewed Murata and provides the following comments. Murata fails to teach or disclose all the elements of the claimed invention. Specifically, Murata fails to teach at least "return current circuit connected in parallel to the counter-electromotive force absorbing circuit, and a control circuit for outputting a pulse signal for intermittently bypassing the return current through the return current circuit while the return current attenuates." Murata merely discloses:

> More specifically, while the first transistor 1 is in an on state, an electrical current is supplied to the coil 3 from the power supply 2, thereby turning on the electromagnet. In contrast, while the first transistor 1 is in an off state, the electrical current flowing through the coil 3 is regenerated through a series circuit, which consists of the second transistor 5 being in an on state and the diode 7, in the manner as previously described using the counter-electromotive force developed in the coil 3 as a supply source. See Murata, col. 9, lines 18-26.

The Office Action has taken the position that the second transistor 5 of Murata corresponds to the return current circuit set forth in claim 1 (see Office Action, page 3, paragraph 5). As indicated by the above-cited passage, in Murata, the state of transistor 1 determines whether current flowing through the coil 3 is regenerated through the second transistor 5. Specifically, because this transistor is controlled by a pulse signal generation circuit 16 (see Murata, Fig. 1), the current flowing through the coil 3 is intermittently bypassed corresponding to the High/Low state of a pulse signal while the main switch is in the ON state, as shown in Fig. 2A of Murata. Accordingly, an uneven waveform of the current flowing through the coil 3 is produced, having a fixed average (see Murata, Fig. 2D).

In contrast, the present invention sets forth a "control circuit for outputting a pulse signal for intermittently bypassing the return current through the return current circuit while the return current attenuates." As shown in Figure 1, in one embodiment of the present invention, an uneven waveform due to intermittent bypassing operation is not produced by the pulse signal (SP) supplied to the driving circuit (120), but is produced in response to a pulse signal (SP) outputted by a gate control circuit 140. This gate control circuit 140 is separate from the driving circuit 120 that drives the coil. Murata does not disclose such a feature. In Murata, the same pulse signal generation circuit that controls transistor 1 also drives the solenoid coil 3.

Therefore, in one embodiment of the present invention, as shown in Figure 2, the average level of the uneven waveform gradually attenuates due to counter-electromotive force produced at the coil after the driving circuit terminates excitation of the coil (see Specification, page 7, lines 14-21). In one embodiment, the uneven waveform gradually attenuates, and is not merely produced in response to the ON/OFF operation of the driving circuit 120 for driving the coil. This is in contrast with Murata, whose uneven waveform is directly produced in response to the state of switch 17 (see Murata, Figs. 2A and 2D).

To qualify as prior art under 35 U.S.C. § 102, a single reference must teach, i.e., identically describe, each feature of a rejected claim. For the reasons provided above, the Applicant respectfully submits that Murata does not teach or suggest each and every feature recited by Claim 1. Accordingly, Claim 1 is not anticipated, nor rendered obvious in view of, Murata.

For at least this reason, the Applicant submits that claim 1 is allowable over the cited prior art. As claim 1 is allowable over the cited prior art, the Applicant submits that claim 2, which depends from allowable claim 1, is likewise allowable over the cited prior art.

Rejections under 35 U.S.C. § 103(a)

Claims 1 and 2 are separately rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuhbauer et al. (U.S. Patent No. 5,933,312) in view of Murata. To the extent this rejection remains applicable to the claims currently pending, the Applicant respectfully traverses this rejection.

To establish a prima facie case of obviousness, every claim limitation must be taught or suggested by the prior art references. M.P.E.P. 2143.03. Schuhbauer does not teach or suggest all the features of the invention of claim 1. The Office Action asserts that Schuhbauer teaches all the features of claim 1 except for a driving circuit for driving a coil of a solenoid in response to a pulse signal supplied from an external device.

Applicants respectfully disagree, and submit that Schuhbauer does not teach or suggest at least a control circuit for outputting a pulse signal for intermittently bypassing the return current through the return current circuit while the return circuit attenuates.

Schuhbauer merely teaches a control voltage that "causes first switching transistor to become conductive and remain so as long as control supply voltage source 8 is connected" (see Schuhbauer, col. 2, lines 54-56). As discussed above, Murata does not cure the above-noted deficiency, nor suggest ways that Schuhbauer might be

modified to cure this deficiency of Schuhbauer. Neither Murata nor Schuhbauer, alone or in combination, teach or suggest all the features of the claimed invention.

For the reasons provided above, the Applicant respectfully submits that neither Schuhbauer nor Murata, alone or in combination, teach or suggest every feature recited by claim 1, as currently pending. As such, the Applicant submits that claim 1 is allowable over the cited prior art. As claim 1 is allowable over the cited prior art, the Applicant submits that claim 2, which depends from allowable claim 1, is likewise allowable over the cited prior art.

Claims 4-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuhbauer in view of Murata, and further in view of Fischer et al. (U.S. Patent No. 6,140,717). To the extent this rejection applies to the claims currently pending, the Applicant respectfully traverses the rejection.

Applicant respectfully submits that one of ordinary skill in the art would not find it obvious to modify and/or combine the applied teachings of Schuhbauer, Murata, and Fisher because the rejection lacks the requisite motivation to combine the applied teachings.

The Office Action asserts that it would have been obvious to one of skill in the art at the time of the invention to make the counter-electromotive force absorbing circuit of Schuhbauer, a transistor circuit such as that of Murata, and to control the switching of the transistor based on the inter-terminal voltage as taught by Fisher. Even if these references disclosed all of these limitations, they do not disclose proper motivation to combine the references. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is

some teaching, suggestion, or motivation to do so. M.P.E.P. § 2143.01. In this instance, the rejection could only be arrived at by piecing together the applied art of record onto the Applicant's application, without any teaching or suggestion in the applied art, simply by using the Applicant's own application as a blueprint, which is the essence of hindsight reasoning and wholly unacceptable for denying patentability.

Additionally, claims 4-7 depend, either directly or indirectly, from independent claim 1. As set forth above, independent claim 1 contains subject matter that is allowable over the cited prior art. None of the cited references, either alone or in combination, teach or suggest ways to modify the references to overcome the above-mentioned deficiencies in the prior art. The Applicant thus respectfully submits that claims 4-7 are additionally allowable for at least the same reasons that claim 1 is allowable.

For the above-given reasons, the Applicant respectfully submits that claims 4-7 are not obvious in view of the applied Schuhbauer, Murata, and Fischer combination and that claims 4-7 should be deemed allowable.

Conclusion

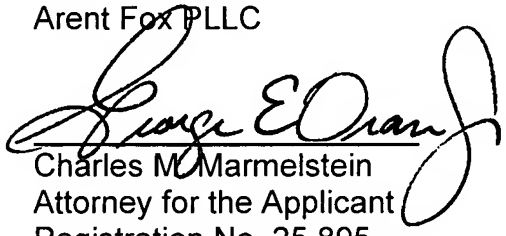
For all of the above reasons, it is respectfully submitted that the claims now pending patentably distinguish the present invention from the cited references. Accordingly, reconsideration and withdrawal of the outstanding rejections and an issuance of a Notice of Allowance are earnestly solicited.

Should the Examiner determine that any further action is necessary to place the application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicant hereby petitions for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referencing Attorney Docket Number 107439-00091.

Respectfully submitted,

Arent Fox PLLC



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Enclosure: Corrected Drawing Figures 3 and 4 (1sheet)